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ABSTRACT

A study was conducted to determine whether composition students revise more and write better essays on a word processor than they do with pen, ink, and typewriter. Students wrote four out-of-class papers, with two classes using computers and two using pen, paper, and typewriter. Students had to produce at least two drafts of each paper. Sixty papers, from 30 students, were scored on a modified Diederich Analytic Scale. The researchers (composition class teachers) read each paper, comparing each and tallying whether each change was global, sentence, or surface level. Results indicated that the pen and typewriter group made more changes from the first to the last draft. The breakdown of changes showed that students made more sentence and surface level changes than global ones. The gain scores of the computer and pen and typewriter groups showed no significant difference as determined by a t-test. (Three tables of data are included.) (MG)

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To many first year composition students, revision means checking the spelling and putting in some commas, while the larger, global areas remain untouched. Others copy their drafts, changing little. In fact, as Donald Murray says, the vast majority of students get away with "first draft copy" (Murray, 1978). Experienced writers, however, revise on all levels and to greater extent. It was this reluctance to revise on the part of our composition students in the Language Skills Center at SUNY Geneseo that led to our investigation.

In recent years, writers and researchers have pointed out the possibilities of word processing with its ease of text editing and manipulation and have suggested that the computer can help students revise by reducing the frustrations of recopying, retyping, and by producing neat, publishable copies (Whithey, 1983, Schwartz, 1984).

REVIEW OF RELATED STUDIES-- As Murray (1978) points out, "rewriting is the difference between the amateur and the professional. Yet revision is one of the least researched, least examined, and usually least taught" areas of composition. Since Murray's comment, though, more research on revision has been conducted. Nancy Sommers produced one of the most thorough studies comparing the revision strategies of student writers

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with those of experienced adult writers (Sommers 1980). By counting and categorizing the draft changes made by beginning students and professional writers, she showed that the experienced writers made more changes in sentence and global areas while students' revision resembled correction. Flower and Hayes' (1981) protocol analysis of the composing process observed the differences between novice and experienced writers.

Professional writers, teachers, and researchers who began using the computer for word processing claimed that it could aid in the writing and revising process (Zinsser, 1983). These writers found the editing features of the word processor freed them to write more and revise more because the physical act is easier than revision with traditional methods (Daiute, 1983a, Case, 1985, Lutz, 1985).

Much of the research studying word processing and revision has provided suggestions rather than conclusive evidence. Harris (1985) presents an overview of research in the area and says that few of the existing studies provide information about how word processing affects student writing. Many fail to define what they mean by revision and do not distinguish between revision, editing and proofreading. Womble (1984), reporting on three case studies of tenth grade students, found that the students stayed longer with the writing and did more revising because the physical act of writing was easier, and seeing work on the screen helped students to see what changes needed to be made. Haas and Hayes (1986),

however, in studying students' reading from the machine, say that students often revise from hard copy because the screen is more difficult to read. Collier (1983) reports on a pilot project using four subjects and points to the computer being an advantage for the experienced writer, but inexperienced writers became entranced with the superficial. Sudal (1985) again talks about ease of revision with the word processor but offers no hard evidence that students do it.

Several researchers have found that while the computer motivates students and fits in well with the process approach, there is little difference in the quality of writing (Kurth, 1987, Brown, 1985, Daiute, 1986b, McAllister and Louth, 1987). Gail Hawisher's (1987) research indicates that advanced composition students using pen, paper and typewriter revised significantly more than those using word processing, but the increased revision did not result in superior papers. On the other hand, Etchison (1985), studying 200 first year students, found that students using the computer had a significantly greater pre-post gain and better T unit growth than did the control group. Pence and Williamson (1988), after observing writers at work, concluded that when comparing word processing to handwriting, "Word processing... seems to help students write longer essays but does not affect the type or amount of revision, if you discount typographical errors."

PURPOSE OF THIS STUDY-- The purpose of this study was to determine whether our composition students revise more and write better

essays on a word processor than they do with pen, ink, and typewriter. Teaching classes designated as using word processing for beginners as well as the standard "Process of Writing" sections, we observed some disappointing levels of revision on the part of the new computer users. Consequently, we initiated a study comparing these two "computer sections" with paired classes not involved with any formal instruction in word processing. "Process of Writing" is a required course for approximately one-third of the freshman class, and the random student placement in fall classes provides an excellent population for comparitive study. Dividing revision into surface, sentence, and global levels, we compared the levels and frequency of revision between two sets of paired classes.

The major focus of the instruction in all classes is expository writing. These classes emphasize prewriting skills, draft writing, revising and editing skills, and students are encouraged to use them. Teaching strategies for revision emphasize global revisons, those that affect the structure and meaning of the essay such as adding a detail or rearranging the order. Students write four out-of-class papers with two classes using computers and two using pen, paper, and typewriter. Students must produce at least two drafts of each paper. The word processing sections initially receive two--one hour orientations on the Apple IIe computer using Appleworks software, focusing on enter; retrieve document, save document; delete letter, word, line, or block; move sentence, paragraph, or

block; print; and exit. This instruction should enable most students to manipulate text and make changes. In addition, tutorial aid is provided in the writing center for students having difficulties with the machine or software, and the computer lab is available to students during the day and evening. At midterm, the students return to the computer lab as a group for two hours of revision and editing review classes. All papers are scored on a modified Diederich Analytic Scale, a widely used test for measuring writing.

SAMPLE SELECTION AND ATTRITION-- Our original plan was to take four sections of Writing 100 (15-16 students per section) and study the early and final drafts of the four out-of-class papers. The single most important information we derived from this study was a list of preventive measures against sample attrition. We disqualified our first paper on the grounds that the students were learning to use the machine; their emphasis seemed to be on producing a printed page, and we felt that some in the computer sections were responding more to the machine than to the assigned writing task. The cognitive overload might be too heavy a factor. This was also a peer assessment paper, and our final paper was instructor conferenced, a factor that could influence the revision in the global areas of ideas and organization. The third paper, like the first, was a peer assessment as well as a critical analysis, the form of which had much prompting, including a model. This critical analysis paper was also disqualified. We decided to work only with the second and fourth papers, the midterm and

the final papers, both student-instructor conferenced after the first draft. These conferences focused on ideas and organization. Both the writing situations were taken from William McCleary's WRITING ALL THE WAY, Wadsworth, 1988. Another commonality was that both of these papers, the midterm and the final, were written with a significant grade motivation (first year students at Geneseo receive midterm grades), whereas all others papers could be revised and edited throughout the term to attain higher grades.

Preventable, theoretically, is the lack of availability of hard copy drafts for analysis. Towards the end of the term, some of the students in the computer sections were learning the wisdom of saving changes every ten to fifteen minutes and, although we offered free paper to these two sections, many times they would be working between other classes or otherwise in a hurry and no printing would occur. Pence and Williamson call this the "drafting stage," when students come with only pen notes and draft on the screen. However, at the beginning we found many students using the computer as a typewriter and found as many as six penned drafts for two students, apparently done before anything was typed on the computer. (To make the situation worse, this happened in a section that had supposedly started the paper in the computer lab. What happened in one case was that the student returned to the dorm and did not like what she had written, so started over and over and over late at night and did not return to the computer lab until she had something satisfying in her

notebook.) She and others were perfect examples of Pence and William's phase one, "recopying and editing."

Possibly preventable is the lack of dating on drafts. We spent more time than we cared to count working through drafts all identically dated. This omission is so easy, and a great temptation to anyone. Why type a new date for the file? Had we foreseen this problem, we could have emphasized checking in class and updating or numbering the drafts by hand. We always ask to have them stapled in reverse chronological order, but sometimes the students were careless, so we had to compare and read several versions to choose the earliest. We did use the earliest more or less complete draft, putting aside what appeared to be creating stages such as free or guided writing and some well developed intermediate stages since students had such varied numbers of intermediate drafts.

ANALYSIS-- After putting aside all drafts that did not conform to our criteria, we had fifteen computer students from the two sections. Since we had more than that number in the non-computer group, we did the simple random sample selection of drawing names on folded slips of paper tossed into a pencil holder.

We read the second and fourth papers of the fifteen students in each group, dealing with two drafts each of sixty papers in all. We read these drafts to each other, comparing each as we went along and tallying whether each change was global, sentence, or surface level. With a few

small alterations, we made these areas synonymous with our modified Diederich Analytic Scale: Ideas and Organization changes were global, Vocabulary and Sentence Structure were sentence level, and Punctuation and Spelling were surface changes. We tallied errors in each of the three categories, discussing questionable placements. Examples of minor changes from our grading procedures are the moving of the comma splice to surface category rather than sentence level change, whether sound alikes go in vocabulary or spelling, and the number of tallies for paragraphs that were both moved and significantly changed in ideas. We also counted the gain scores for each student in the study, indicating with plus or minus the number of points of difference and compared the gains of each group in scores between Paper Two and Paper Four. Since length was another consideration, we also estimated the word length of each paper and compared word length between the two groups to determine if indeed the computer students wrote longer essays.

FINDINGS-- When comparing the incidence of revision between the two groups, we found that the pen and typewriter group made more changes from the first to the last draft. The breakdown of these changes into the three categories--global, sentence and surface--showed that students made more sentence and surface level changes than global ones. However, we were surprised at the number of global changes students made. We had expected fewer.

The gain scores of the computer and pen and typewriter groups

showed no significant difference as determined by a t-test. Similary, the quality of the two groups' papers was essentially the same; that is, when scored on the Modified Diederick Analytic Scale, the mean scores of the papers showed no significant differences. However, as expected the grades for each group did improve on Tp# 4, the final paper. When we analyzed the scores and the number of revisions, we found no correlation. That is, more changes did not result in better papers.

See tables in appendix for more details.

SIGNIFICANCE--The study has been valuable to us. Even with the sample at half the projected size, the results indicate agreement with the larger, more sophisticated Pence and Williamson study: except in length, we do not see a significant difference between the revision of the computer/non-computer classes; seven computer students had one or more complete pen drafts of the earlier paper, but only two computer students had a complete pen draft of the final paper. The computer students appeared to be following Pence and Williamson's stages of adjusting to the pressure of learning to use the machine.

Were we to enlarge the study, we would again select the fall term for a student sample, keep a stricter count of the order of drafts, and insist on at least one hard copy of an early draft. We probably would split our global category into ideas and organization changes. We would also design a check sheet to allow for easier, faster recording.

We now have a stronger idea of what studies are of potential use to

us as classroom teachers. As classroom teachers, however, our first priority is teaching. We do not want to adapt our course to fit a research design. We do not have TA's to work on the research or the time to create elaborate research designs. At this point, we are pleased to know what we can do, and we estimate approximately how large a study we could manage in how much time. On questions like revision, when the supposed evidence looks in both directions and we don't want to wait for the jury to come in, it only seems reasonable that we, the classroom teachers, consider conducting our own research appropriate to situations.

TYPES OF REVISIONS

	COMPUTER		PEN AND TYPEWRITER	
	TP#2	TP#4	TP#2	TP#4
GLOBAL	21.73 m 1.45	37.1 m 2.47	33.33 m 2.22	60 m 4
SENTENCE	77.46 m 5.16	88.12 m 5.87	122.52 m 8.17	92.92 m 6.20
SURFACE	78.69 m 5.24	63.19 m 4.21	110.36 m 7.36	38.15 m 2.54
TOTAL	177.88 m 11.86	188.41 m 12.56	266.21 m 17.75	191.07 m 12.74

*per 250 words

GAIN SCORES

COMPUTER	PEN AND TYPEWRITER
2.07 MEAN GAIN	2.5 MEAN GAIN
3.15 SD	2.40 SD

Scored on a 24 point scale

Note. No significant gain at the .05 or .01 level

t-test used

LENGTH OF ESSAYS

	COMPUTER	PEN AND TYPEWRITER
TP#2	610 words	555 words
TP#4	862 words	813 words